Swiss design and development

EoC 1-01

Ethernet over Coax

Operation Instructions

KLASSE A CLASS

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Safety instructions

- ➔ Do NOT use the device near water or in rooms with high humidity such as humid cellars or near swimming pools.
- ➔ Do NOT use the device outdoors. All connections must be located inside a building.
- ➔ Keep the device away from moisture, dust or corrosive liquids.
- ➔ Do NOT install the device, use it or perform maintenance during a thunderstorm. There is a risk of electric shock during thunderstorm.
- ➔ Connect ONLY appropriate accessories to the device.
- ➔ Make sure that all cables are connected to the correct port.
- ➔ Carefully lay the Ethernet, antenna and electric cables to ensure that nobody can step on or stumble over them.
- ➔ Do NOT cover the ventilation slots of the device since insufficient air supply may result in damage to the device.
- ➔ Do NOT place any objects on the device. Position the device in a place where NOBODY can step on it.
- ➔ Prior to maintenance or dismounting work, disconnect the Ethernet and electric cable from the device.
- ➔ In case of damage, interrupt the power supply.
- ➔ Do NOT try to repair the device. Contact your local retailer to order a new device.
- ➔ Do NOT open the device or unit. Opening the device or removing its covers causes risks, for example due to high voltage. This device should ONLY be repaired or uninstalled by qualified service personnel. For more information, contact your retailer.

1. Product description

1.1. Disposal of wastes

Your device is marked with the WEEE symbol (Waste Electronics and Electrical Equipment). This means that the electrical and electronic components must not be disposed of as residual waste. Used electrical and electronic components must be disposed of separately.

1.2. Scope of delivery

EoC 1-01

1 x EoC 1-01 Ethernet over Coax Modem

1 x Network cable 1.5 m (RJ45)

1 x Power cable with euro plug

1 x CFA 8-00 terminating resistor

1 x Quick Start Guide

EoC 1-00

2 x EoC 1-01 Ethernet over Coax Modem

2 x Network cable 1.5 m (RJ45)

2 x Power cable with euro plug

2 x CFA 8-00 terminating resistor

2 x Quick Start Guide

Lieferbares Zubehör:

- IEC connecting cable 1.5…10 m BAK 150-80 – 999-80
- Modem connecting cable 1.5…10 m MAK 150-80 – 999-80
- Adapter F/IEC CFA 1-00, IEC socket / F plug
- Adapter F/IEC CFA 10-00, IEC plug / F plug
- Combiner TZU 40-03

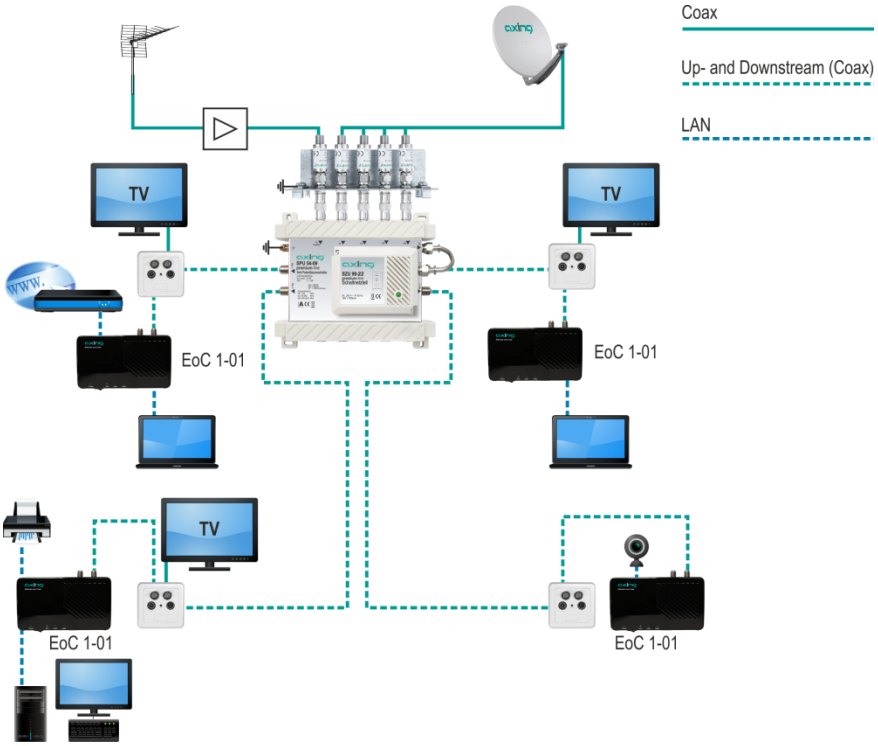
1.3. Field of application

The EoC 1-01 modem allows feeding in of IP data signals from the Internet, for example via a router in an existing coaxial antenna distributor, such as SAT-IF-, DVB-T, CATV- or head end distribution systems (in the star or tree distribution).

Several Eoc 1-01 modems communicates in a Peer-to-Peer mode. This means that each modem can communicate with each modem in the network.

The advantage of an ethernet solution over a coax solution is that no new network cables must be laid. The data is transmitted through the low-attenuation return channel, frequency range of 2...68 MHz. Depending on the quality of the coaxial cable, transmission distances of up to 700 m can be realized.

The feeding in is performed via the return channel capable terrestrial input of the SAT multiswitch, via the terrestrial input of the antenna distributor structure or via a return channel capable antenna socket in the distribution network (see example 1...5).

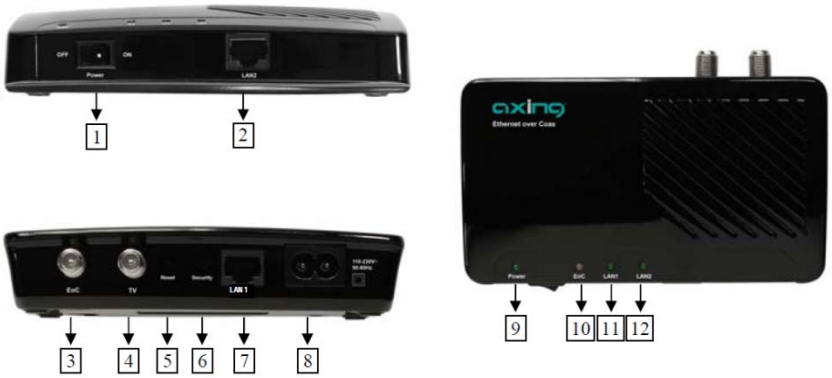


Internet or other fed IP data are available at return channel capable antenna sockets (e.g. AXING antenna socket BSD 4-xx, BSD 21-xx, BSD 960-00, BSD 961-xx, BSD 963-xx, SSD 2-xx, SSD 4-00, SSD 5-xx, SSD 6-xx or SSD 7-00) (connection examples for AXING antenna sockets are given on the Internet under www.axing.com | Download).

Two networkable devices can be connected to the LAN ports of a EoC modem. The IP network can be extended to up to 64 EoC devices.

All devices connected to the EoC modems can communicate between each other. Data is exchanged, network games are transmitted or a centralized network printer can be accessed. For the monitoring of houses, rooms etc., an IP camera can be operated via a EoC modem.

1.4. Connections, indications, operating elements



1. Power ON/OFF
2. LAN 2, RJ 45 socket
3. EoC F-socket (data + TV 2-862 MHz)
4. TV- F socket (85-862 MHz)
5. Reset button
6. Security button
7. LAN 1, RJ 45 socket
8. Mains socket 110-230 V
9. Power LED
10. EoC LED
11. LAN 1 LED
12. LAN 2 LED

A TV or radio device can be connected to the TV-F socket on the rear side of the EoC modem. The integrated distributor is equipped with a highly selective filter so that the TV/radio reception is not interfered with by the data traffic.

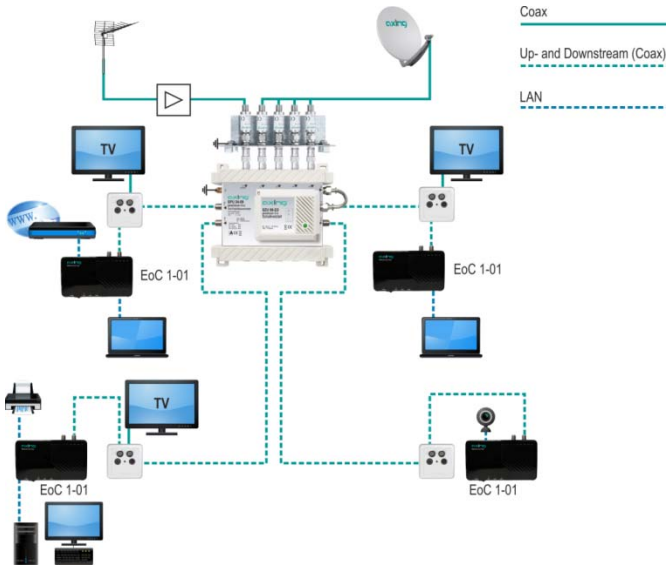
If the TV F socket ist not used, the socket has to be terminated with an termination resistor CFA 8-00!

1.5. Application examples

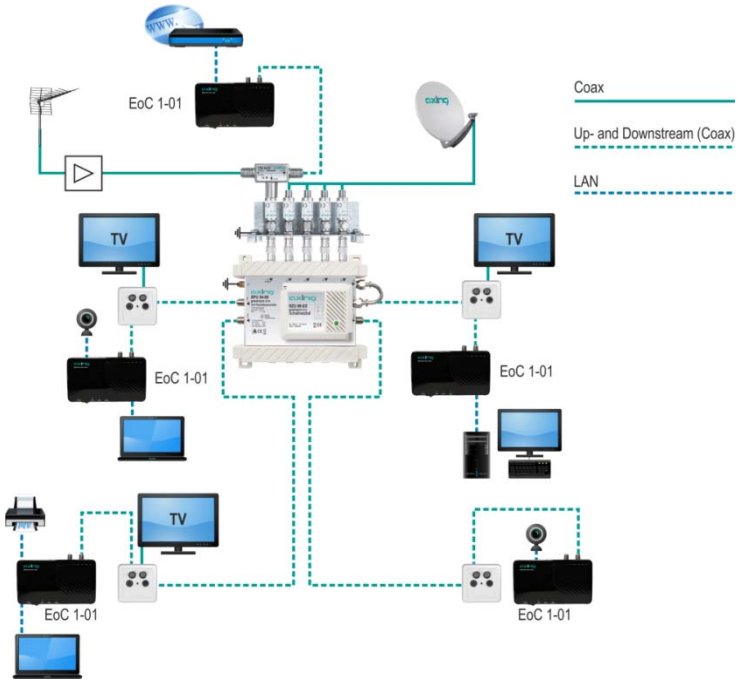
All components in the distribution structure must support the return channel frequency range 2-68 MHz. This also applies to SAT multiswitches, the passive distribution components and for antenna sockets.

Feeding in of IP data in a SAT-IF distribution structure:

If the terrestrial input of the SAT multiswitch is not assigned, it must be terminated with a 75 Ohm terminating resistor.

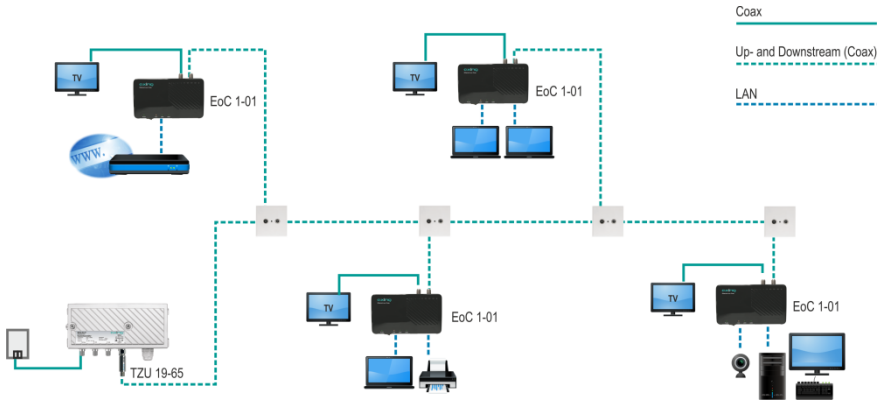


Example 1: The feeding of the IP signal is performed via the **return channel capable antenna socket**.

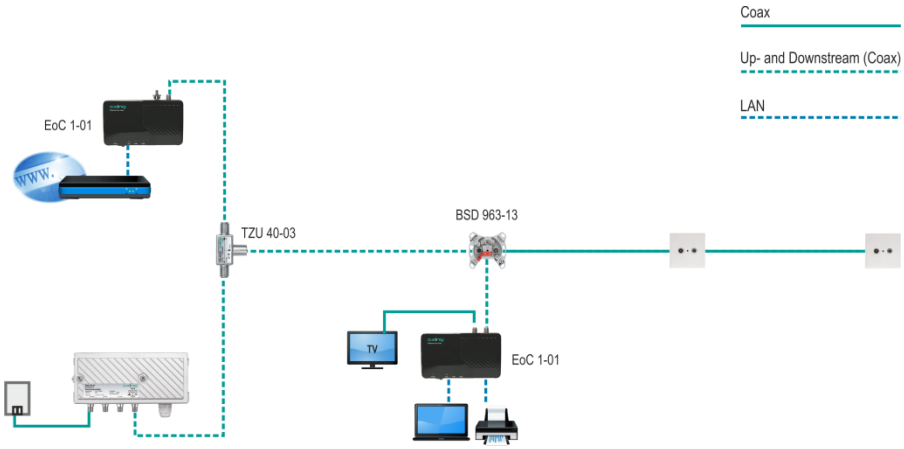


Example 2: The feeding of the IP signal is performed via the **return channel capable terrestrial input of the multiswitch**. A combiner TZU 40-03 is used. It prevents that the IP signals are transferred via the return channel into the receive antenna system.

Feeding in of IP data in a CATV distribution structure:

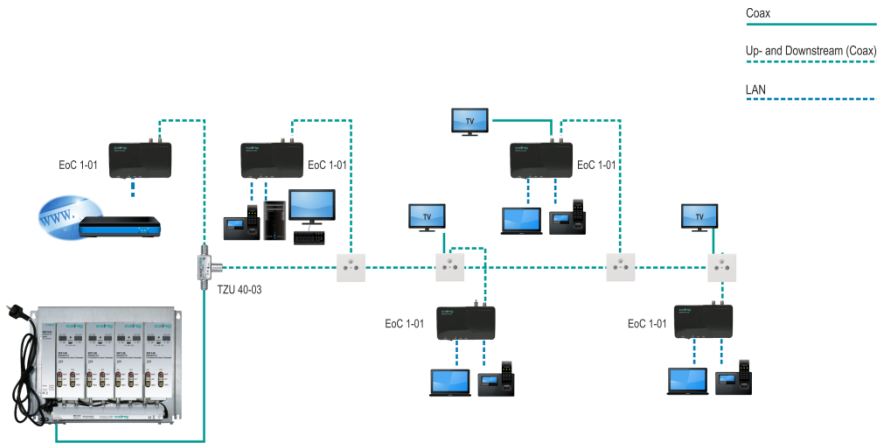


Example 3: The feeding of the IP signal is performed via **the return channel capable antenna socket.** If the IP-data are fed via the antenna socket, a high-pass filter TZU 19-65 must be installed in the coaxial supply line (amplifier output).



Example 4: IP data feeding for exactly one antenna socket: The feeding of the IP signal is performed **via the EoC combiner TZU 40-03**. The integrated high pass of 85-1006 MHz prevents the transmission of the IP signal in the CATV network. The antenna socket BSD 963-13 is equipped with a high pass filter on the trunk. The IP signal will not be transferred to the following antenna sockets.

Feed in of IP data in a headend system:



Example 5: The feeding of the IP signal is performed **via the EoC combiner TZU 40-03**. The combiner TZU 40-03 has an integrated high pass of 85-1006 MHz. The high pass prevents the transmission of the IP signals to the head end.

2. Installation and commissioning

1. Connect the router with the enclosed Ethernet cable to one of both RJ-45 LAN sockets of the EoC modem.
2. Connect the EoC socket to the available antenna network structure
   (see example 1 to 4).

There are several ways to feed the IP data into the existing antenna network structure.

- via a return channel capable antenna socket in the distribution network (see example 1 or 3)
- via the passive terrestrial input of the SAT multiswitch or the passive terrestrial input of a distribution structure (see example 2 or 4).

3. Connect your computer using the enclosed Ethernet cable to one of both RJ-45 LAN sockets of the second EoC modem.
4. Then connect the EoC modem using the EoC-F socket to the return channel capable antenna socket (see example 1 or 3) or to the **return channel capable** EoC combiner (see example 2 or 4).

➔ Repeat step 3 + 4 for further commissioning of EoC 1-01.

After all connections have been established, the EoC devices can be switched on by means of the mains switch and the connected devices (PC, laptop etc.) can be booted up.

The LEDs Power, EoC, LAN and WiFi are lit and the data transfer is established.

Notes:

- Up to two networkable devices can be connected to one EoC modem.
- Additionally, a TV or radio device can be connected to the TV-F socket of the EoC modem.

3. Basic functions

After having switched on the EoC modem, the LEDs should indicate the following states:

- The green Power LED is lit.
  - After approx. 10 seconds, the LEDs are lit/flashing as follows:
  - EoC LED green (flashes in case of data traffic)
  - LAN LED green (flashes in case of data traffic)
  - WiFi LED green (if WiFi is switched on) green (flashing in case of data traffic)

3.1. Standby mode:

The EoC modem switches after several minutes without data traffic to the Standby mode. The Power LED is flashing green then.

3.2. EoC Reset button:

The EoC reset button is used for the following functions:

- reset to the factory default setting (press > 10 s).
- delete the network key (press 5…8 s)
- generate a private network (press <1 s)

3.3. EoC Reset Function:

Hold the reset button depressed for one second using a bent up paper clip, in order to reset the device to the factory defaults.

The EoC reset button does not work in standby mode.

4. EoC network with encryption

An EoC network consists of two or several (maximum 64) EoC modems which use the same network key.

In an existing antenna system with several participants, all devices can communicate with each other. Therefore, you should create a private EoC network.

Securing your EoC network allows you to protect the information sent via the network from unauthorized access. This is particularly important in multi-family homes, office buildings, schools and other buildings.

There are two ways to secure your EoC network.

- Use the security button to generate a random network key automatically.
- You can use the Security software to specify a key for your EoC network (free download under http://www.axing.com | Download).

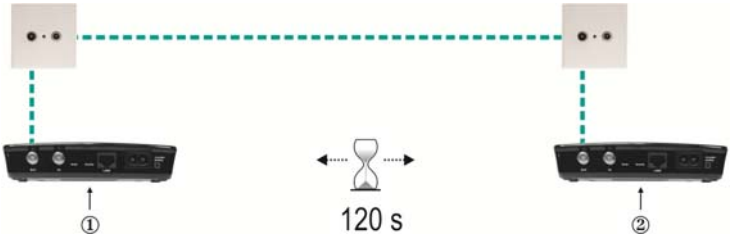
4.1. Pair or group formation:

Deleting the network key:

To generate an invidual network key, you have to delete the default network key first. Press the security button on the rear side of the EoC device for 5…8 seconds (until the Power LED flashes). Carry out this step for all devices.

Pair and group formation:

Press the security button briefly (<1 s) on the rear side of the EoC device. The Power LED starts flashing. Now also press the security button of the next EoC modem briefly. A new network key between the two EoC modems is generated and the devices establish a connection. The EoC LED will flash for a short time.



In order to connect the two devices to each other, press the security button on the second device within a time period of two minutes.

➔ Check the LEDs on both EoC devices. The Power LEDs must flash during the connection establishment of the devices. Wait for approx. one minute while the EoC devices get connected to each other. As soon as the procedure has been completed, both Power- and EoC LEDs are again permanently lit.
If the Power LED is not flashing, after you have pressed the security button, then you might have kept it pressed for too long.

➔ Try it again and press the security button for <1 second.
If the EoC LEDs are not lit on both EoC devices, the EoC devices are not connected. Repeat the steps in this section.

5. Troubleshooting

5.1. LEDs

LEDs

The LEDs indicate an "activity" and are used for troubleshooting.

Power LED off

➔ Make sure that the network cable is connected correctly.
➔ Make sure that the mains switch of the EoC modem is switched on.

LAN LED is not flashing

No data traffic. Check the following:
➔ Are the router and the modem switched on?
➔ Is the Ethernet cable connected firmly to the LAN port of the router/modem?
➔ Can the PC - connected to the router - establish a connection to the Internet?
➔ Press the EoC Reset button on each EoC modem for 10 seconds to restore the factory settings of the EoC modem.
➔ If necessary generate a new network key (see chapter 4 on page 12).

EoC LED off - is not lit

The EoC devices cannot be found.
➔ Make sure that the EoC devices are connected to the same antenna network and that they use the same network key.
➔ Position the EoC modem closer to the computer or the EoC modem.
➔ After having activated the network security, make sure that all EoC modems use the same network key.
➔ If the problem occurs, after the network key has been changed, re-establish the factory settings of each device again. Then, you can generate the key again (see chapter 4 on page 12).
➔ Check whether your antenna system provides a return channel.

EoC-LED is lit in red

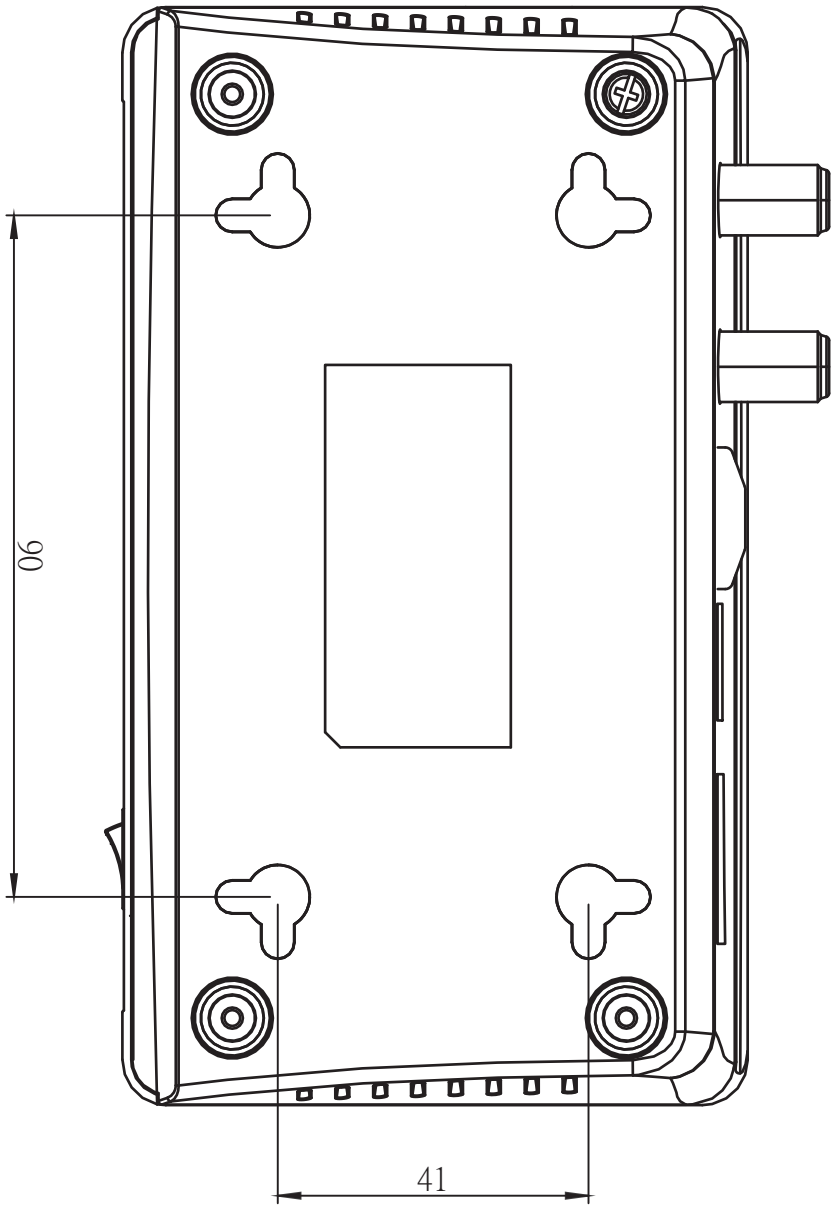
➔ The line attenuation between the EoC modem is too high. Position the EoC modem closer to the master device.

6. Technical data

6.1. Data sheet

Frequency range	
EoC input/output	2…1006 MHz
IP signal	2…68 MHz
TV output	85…1006 MHz
Through loss	<0,5 dB
Output level min. 1…30 MHz	100 dBµV
Output level min. 30…68 MHz	90 dBµV
Network	Up to 64 EoC modems
Gross data rate	500 Mbps
Net data rate	230 Mbps
Range	up to 700 m
Modulation	4096/1024/256/64/16/8-QAM, QPSK, BPSK and ROBO modulation scheme
Encryption	128 bit AES
Ethernet interface	10/100/1000 Mbps
Network standards	Home Plug AV IEEE1901, IEEE802.3, IEEE802.3u
WiFi network standard	IEEE 802.11/b/g/n
Frequency range	13 channels 2.412GHz~2.472GHz
Connections (TV/EoC)	2 F sockets
Connections (LAN)	2 RJ 45
LEDs	Power /EoC /LAN/WiFi
Switching power supply unit	110-230 V~ 50/60 Hz
Power consumption	max. 5.5 W
Operating temperature	0°C ~ 40°C
Dimensions	145 (W) x 82.5 (D) x 33 (H) mm
Corresponds to the standards	EN 50083-2 Class A

6.2. Drilling template



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